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SUBJECT: ABU DHABI MEGA PROJECTS: MASDAR ZERO-CARBON RENEWABLE ENERGY CITY

REF: REF: A) Abu Dhabi 920, B) Abu Dhabi 943
C) Dubai 271, D) Dubai 272,

¶1. (SBU) Summary. The Abu Dhabi Government, guided by Crown Prince Mohammed bin Zayed (MbZ), is pursuing the renewable energy and sustainable development initiative "Masdar" to maintain Abu Dhabi's role as a global energy player in the long term. The Masdar initiative includes the Masdar Institute of Science and Technology (MIST), an Innovation and Investment branch, and the "clean tech cluster" in the Special Free Zone of the anticipated US $22 billion "zero-carbon" Masdar City. End summary.

ENERGY SHORTAGE IN THE GULF?

¶2. (SBU) Despite the UAE having the world's fifth largest gas and oil reserves, electricity shortages are a serious and growing problem, reminding the UAE that it cannot build a future on oil alone. According to press reports, every GCC country other than Qatar is facing shortages of natural gas (in fact, most of the UAE's electricity is generated from Qatar's gas reserves). While Abu Dhabi's electricity supply currently exceeds demand, official forecasts project that the equation will reverse by 2011. Due to limited feedstock and distribution infrastructure, the smaller emirates, such as Ras Al Khaimah, already face acute water and energy shortages(refs A and B). Gas shortages recently forced one company to cancel a USD $5 billion aluminum smelter in Abu Dhabi. Masdar officials confided to POLOFF and ECONOFF that even now Abu Dhabi sells 600-800 MW of electricity to Dubai to meet demand there. Abu Dhabi is looking for energy stability over the long term, pursuing peaceful nuclear power (ref C) and to a lesser extent alternative energy research.

MASDAR: (PART OF) THE SOLUTION

¶3. (SBU) Mubadala, Abu Dhabi's creative development arm, is executing the Masdar project -- a long term strategic development program aiming to: (1) maintain and expand the emirate's role in global energy, (2) turn Abu Dhabi from a technology consumer to a technology producer, (3) develop local human capital in scientists and businessmen, and (4) diversify the local economy. In a meeting with POLOFF and ECONOFF, Masdar officials explained that the name Masdar, meaning "source," was personally chosen by MbZ and that the ambitious initiative benefits from his personal interest.

"A DISNEYLAND FOR ENGINEERS"

¶4. (SBU) Masdar's hub will be Masdar City (MC), a USD $22 billion, 6 square kilometer, walled area exemplifying the sustainable city of the future. Construction has already started near the Abu Dhabi

International Airport, with the last phase not expected to finish before 2015. In a meeting with POLOFF and ECONOFF, MC officials described the city's planned energy sources: 50% photovoltaics (solar panels), 26% concentrating solar thermal power (many mirrors focusing light on a single point to generate heat), 7% waste composting & biodigestion, 1% wind, and the remainder potentially ground-sourced heat pumps (geothermal cooling to reduce air conditioner use) and other sources. No cars will be permitted in MC; rather, electric pods will follow magnetic strips to take passengers around the compound (and parking lots are envisioned on the outskirts). A light rail system will connect MC to downtown Abu Dhabi and the international airport. Outside the city's walls Masdar will build solar fields, a solar-powered desalination plant, a wastewater treatment plant, and recreational areas. (Comment: While Masdar's website also notes plans for biofuel plantations, a wind farm, and a recycling center, the overall plan is very much a work in progress. End comment.) The much-publicized aim is for MC to produce no net carbon emissions, no waste, and to reduce desalinated water consumption by 80%. More broadly, MC aims to be an eco-friendly example for the world.

¶5. (SBU) In addition to eliminating waste and carbon emissions, MC's second role is to serve as a "clean tech cluster." MC will house 50,000-100,000 residents, the MIST Institute (see paragraph six), commercial areas, and the Special Free Zone (SFZ). MC is hoping to attract up to 1500 companies to the SFZ with a variety of incentives: no taxes, full foreign ownership permitted, and intellectual property protection. Officials describe it as Abu Dhabi's first free zone, similar to Jebel Ali in Dubai. Within the SFZ, the Emirate promises transparent laws and "accelerated regulatory approval," as environmental technologies are difficult to register in many countries. Abu Dhabi authorities also advertise the mix of research and industry inside Masdar City, a cheap manufacturing base, and quick access to the high demand MENA region as well as South Asia and Africa. Employees of MC "clean tech"

companies will be given first choice of MC residences. Other potential residents will need to apply and will be screened. MC will also contain several hotels, primarily geared toward business travelers.

STRONG EDUCATIONAL ELEMENT ENVISIONED

¶6. (U) The primary foci of Masdar are sustainable energy, carbon management, and water conservation. In order to gain technical expertise, Masdar has established a research network of leading universities and research institutes in North America, Europe, and Asia. In addition, Masdar is partnering with the Massachusetts Institute of Technology to open the graduate-level Masdar Institute of Science and Technology (MIST) in fall 2009. The plan, reportedly, is for MIST to have the same admissions standards as MIT. All admitted students (including Emirati nationals and non-citizens) will be provided free tuition, housing, and a stipend. MIST faculty will spend their first year in Massachusetts auditing the classes they will teach at MIST and working in a related research group, in order to encourage collaboration between the two universities. The five MIST degree programs will not be separated into departments, in order to promote interdisciplinary collaboration.

¶7. (SBU) Officials explained that the uniqueness of MIST lies in its focus: MIST will be the first university in the world to offer degrees in multiple traditional disciplines (e.g., mechanical and electrical engineering) exclusively focused on sustainability. In line with Abu Dhabi's goal of developing local human capital, between 20-30% of MIST students will be Emirati. (Comment: It is questionable whether rigorous "MIT standards" would normally be met by so many students from one small country's limited population base; standards may need to be adjusted to achieve the goal of Emirati participation. End comment).

BEING PART OF THE MASDAR BRAND

¶8. (SBU) MC officials say the project is progressing well. MC is

reportedly "inundated" with companies wanting to be part of the Masdar "brand," as ninety-two percent of the Abu Dhabi references in the world media right now reportedly mention Masdar. MC officials explain that in the long term Abu Dhabi will gain "knowledge capital" to be replicated and deployed around the world. The potential for intellectual property rights alone would, by some accounts, be a long term profitable investment.

¶9. (U) According to the UAE press, the "master planners" of MC already announced in May 2008 plans to build a similar city in Jordan -- to house 700,000 to one million people and designed more as practical middle-class housing than as a "big statement." While the Jordanian city will not be free of carbon emissions, it will use many of the same technologies as MC to decrease energy and water usage. Masdar itself will not be involved, although it is the brain trust from which the concept was generated. (When asked about the Jordan project, MC officials described any links to Masdar as "journalist distortion." Officials explained that UK-based WSP, the consultant which designed Masdar's utilities, is or was among the consultants in the Jordan project. The connection ends there. Officials described this instance as one of many examples of companies wanting to claim some part of the Masdar name, evidence of the success of the "branding" of Masdar.

MAKING SUSTAINABILITY (ECONOMICALLY) SUSTAINABLE:
THE CROWN PRINCE'S PROJECT

¶10. (SBU) Officials stress that MC is not an isolated experiment, but the initial concept that will seek solutions applicable to all of Abu Dhabi and the world. Atypical in UAE development strategies, MC is mandated to decrease demand for utilities. Officials stated that MC must prove to be both environmentally and economically profitable: if not, no one will repeat the experiment. Another goal of Masdar is to "quantify the cost of green" for future projects. When asked if any effects of Masdar were yet visible in other Abu Dhabi projects, officials focused on the long term effect: "This is the Crown Prince's Project. He's not going to let Masdar be a city of green in an island of brown."

NOT THE ONLY BELIEVER

¶11. (U) Masdar is not alone in its belief in financial success for renewable energy in the Gulf. The Dubai-based Gulf Research Centre recently published a study concluding that: "Rising domestic energy needs for power generation and desalination, favorable conditions for solar energy production and interest in acquiring technological

know-how make a perfect argument for renewable energy in the Gulf." The report suggested that renewables could develop into a "major pillar" of GCC economies, stretching the lifeline of oil and gas and gradually substituting for them as a primary export. The report suggested that solar energy in particular (both CSP and thin film PV) have great promise. The emirates of Ras Al Khaimah and Dubai have also announced feasibility studies and pilot projects for solar power.

¶12. (SBU) Comment: With the full financial and political support of Abu Dhabi's Crown Prince and the expertise of top international consulting & technology firms, Masdar seems well on its way to realizing a new level of environmental sustainability. Economic sustainability (i.e., profitability) seems less certain. Clearly a $22 billion project of this nature is a long term investment, some of the benefits of which -- such as development of local capital -- are hard to quantify. It is both interesting and noteworthy that in the face of rising electricity demand, sparked in large measure by an oil-revenue inspired building boom, Abu Dhabi is diversifying in the energy sector -- developing both renewable and nuclear energy programs. Masdar clearly aims to put Abu Dhabi on the map in the field of non-traditional energy. Given 10 years (at the outside) to achieve its goal, the Emirate may well discover how viable that sustainability is. End comment.
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